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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
STAICOVICI, STEFAN	

ART UNIT	PAPER NUMBER
1732	

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6

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/971,721	LENHERR, OTTO	
	Examiner	Art Unit	
	Stefan Staicovici	1732	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *21 April 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *26-89* is/are pending in the application.

4a) Of the above claim(s) *87-89* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *26-86* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *04 October 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date 3.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:

I. Claims 26-86, drawn to a molding process, classified in class 264, subclass 317.

II. Claims 87-88, drawn to a molding apparatus, classified in class 425, subclass 406.

III. Claim 89, drawn to a composite structure, classified in class 428, subclass 98.

The inventions are distinct, each from the other because of the following reasons:

2. Inventions Group I and II are related as process and apparatus for its practice. The inventions are distinct if it can be shown that either: (1) the process as claimed can be practiced by another materially different apparatus or by hand, or (2) the apparatus as claimed can be used to practice another and materially different process. (MPEP § 806.05(e)). In this case, the apparatus as claimed can be used to practice another and materially different process such as compression molding a plurality of resin impregnated fibers without using a core.

3. Inventions Group I and III are related as process of making and product made. The inventions are distinct if either or both of the following can be shown: (1) that the process as claimed can be used to make other and materially different product or (2) that the product as claimed can be made by another and materially different process (MPEP § 806.05(f)). In the instant case, the product as claimed can be made by another and materially different process such welding or bonding two preformed plastic composite shells.

4. Inventions Group II and III are related as apparatus and product made. The inventions in this relationship are distinct if either or both of the following can be shown: (1) that the apparatus

as claimed is not an obvious apparatus for making the product and the apparatus can be used for making a different product or (2) that the product as claimed can be made by another and materially different apparatus (MPEP § 806.05(g)). In this case, the product as claimed can be made by another and materially different apparatus such as a welding or bonding apparatus.

5. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.

6. During a telephone conversation with Mr. Klaus Stoffel on July 14, 2003 a provisional election was made with traverse to prosecute the invention of Group I, claims 26-86. Affirmation of this election must be made by applicant in replying to this Office action. Claims 87-89 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

Specification

7. The disclosure is objected to because of the following informalities: on page 10, line 7, "concensation" should be replaced with --condensation--.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

9. Claims 67 and 69-84 are rejected under 35 U.S.C. 102(b) as being anticipated by Vandas (US Patent No. 4,246,884).

Regarding claim 67, Vandas ('884) teaches forming a wax article by compression molding (plastic deformation) a core mass of wax particles such that all air is eliminated between said particles (see col. 7, lines 2-10 and 20-30).

In regard to claims 69-71 and 75-81, Vandas ('884) teaches compression molding (press-molding) at a temperature less than 215 °F (115 °C), which is the melting temperature of the wax material.

Specifically regarding claims 72-74, Vandas ('884) teaches a synthetic wax (see col. 6, lines 34-35).

Regarding claims 82-84, Vandas ('884) teaches a two-part compression mold in which the top and bottom molds are brought together to mold said wax core (see Figures 5-6).

10. Claims 67-74 and 82-85 are rejected under 35 U.S.C. 102(b) as being anticipated by JP 61-016817.

Regarding claims 67-68, JP 61-016817 teaches forming a wax article by compression molding (plastic deformation) a core wax preform (15).

In regard to claims 69-71, JP 61-016817 teaches compression molding (press-molding) at a temperature of 40-80% of the melting point of the wax, which is 63 °C.

Specifically regarding claims 72-74, JP 61-016817 teaches a paraffin wax.

Regarding claims 82-85, JP 61-016817 teaches a two-part compression mold in which the top and bottom molds are brought together to mold said wax core (see Figures) from a preform.

Claim Rejections - 35 USC § 103

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

12. Claims 26, 32-45, 63-66 are rejected under 35 U.S.C. 103(a) as being unpatentable over Johnson (US Patent No. 5,045,251) in view of Vandas (US Patent No. 4,246,884).

Johnson ('251) teaches the basic claimed process of molding a hollow fiber composite structure having a hollow undercut including, wrapping a wax core with fiber material to form a wrapped assembly, placing said wrapped assembly into a mold cavity, injecting a resin into said mold cavity to impregnate said fiber material, curing (hardening) said resin to form a hardened structure and melting out said wax core to form said hollow fiber composite structure (see col. 6, lines 34-62 and, col. 8, lines 17-24 and 43-47).

Regarding claim 26, although Johnson ('251) teaches forming a wax core having a desired configuration, Johnson ('251) does not teach forming said wax core by plastic deformation. Vandas ('884) teaches forming a wax article by compression molding (plastic deformation) a core mass (see col. 7, lines 2-10 and 20-30). Therefore, it would have been obvious for one of ordinary skill in the art to have used compression molding (plastic

deformation) as taught by Vandas ('884) to form the wax core in the process of Johnson ('251) because, Vandas ('884) teaches that compression molding provides for an improved product by releasing all air bubbles (see col. 7, lines 20-30) and also because, Johnson ('251) teaches forming a wax core having a desired configuration.

In regard to claims 32-34 and 38-44, Vandas ('884) teach compression molding (press-molding) at a temperature less than 215 °F (115 °C), which is the melting temperature of the wax material. Therefore, it would have been obvious for one of ordinary skill in the art to have used compression molding at a temperature less than the melting temperature of 215 °F (plastic deformation) of the wax material as taught by Vandas ('884) to form the wax core in the process of Johnson ('251) because, Vandas ('884) teaches that compression molding provides for an improved product by releasing all air bubbles (see col. 7, lines 20-30) and also because, Johnson ('251) teaches forming a wax core having a desired configuration.

Specifically regarding claims 35-37, Johnson ('251) teaches wax, whereas Vandas ('884) teaches a synthetic wax (see col. 6, lines 34-35).

Regarding claims 45-47, Vandas ('884) teaches a two-part compression mold in which the top and bottom molds are brought together to mold said wax core (see Figures 5-6). Therefore, it would have been obvious for one of ordinary skill in the art to have used a two-part compression mold for compression molding at a temperature less than the melting temperature of 215 °F (plastic deformation) of the wax material as taught by Vandas ('884) to form the wax core in the process of Johnson ('251) because, Vandas ('884) teaches that compression molding

provides for an improved product by releasing all air bubbles (see col. 7, lines 20-30) and also because, Johnson ('251) teaches forming a wax core having a desired configuration.

In regard to claims 63-66, Johnson ('251) teaches glass fibers and epoxy resin (col. 8, lines 64-67 and col. 9, lines 13-18). It is submitted that an epoxy resin cures at about 80°C and is injected at about 60°C in order to avoid premature curing. Further, Vandas ('884) teach a melting temperature of about 115°C, hence requiring such a heating temperature to remove the core from the molded product obtained by the process of Johnson ('251) in view of Vandas ('884).

Specifically regarding claims 51-54, Johnson ('251) teaches melting of the wax material from the resulting fiber reinforced composite (see col. 8, line 15-25). Vandas ('884) teaches that the melting temperature of the wax is in a range of 185-240 °F. Therefore, it is submitted that the heating temperature of the wax core during the resin injection step must within the melting range of the wax core and as such must be within the range of 185-240 °F. Further, it is submitted that the actual temperature is a result-effective variable because, if the heating temperature of the wax core during the resin injection step is too high then the wax core will melt prior to curing of the resin and if it's too low then curing will not occur, hence resulting in a defective product. In re Antonie, 559 F.2d 618, 195 USPQ 6 (CCPA 1977). Therefore, it would have been obvious for one of ordinary skill in the art to have used routine experimentation to determine an optimum heating temperature in the process of Johnson ('251) in view of Vandas ('884) because, Johnson ('251) teaches melting of the wax material from the resulting fiber reinforced composite, hence teaching that if the heating temperature of the wax core during the resin injection step is too high

then the wax core will melt prior to curing of the resin and if it's too low then curing will not occur, as such teaching that the heating temperature is a result-effective variable.

13. Claims 26-31 and 48 are rejected under 35 U.S.C. 103(a) as being unpatentable over Johnson (US Patent No. 5,045,251) in view of JP 61-016817.

Johnson ('251) teaches the basic claimed process of molding a hollow fiber composite structure having a hollow undercut including, wrapping a wax core with fiber material to form a wrapped assembly, placing said wrapped assembly into a mold cavity, injecting a resin into said mold cavity to impregnate said fiber material, curing (hardening) said resin to form a hardened structure and melting out said wax core to form said hollow fiber composite structure (see col. 6, lines 34-62 and, col. 8, lines 17-24 and 43-47).

Regarding claims 26-31, although Johnson ('251) teaches forming a wax core having a desired configuration, Johnson ('251) does not teach forming said wax core by plastic deformation of a wax preform. JP 61-016817 teaches forming a wax article by compression molding (plastic deformation) of a core wax preform (15). Therefore, it would have been obvious for one of ordinary skill in the art to have used compression molding (plastic deformation) of a wax preform as taught by JP 61-016817 to form the wax core in the process of Johnson ('251) because, JP 61-016817 teaches that compression molding provides for an improved product by avoiding shrinkage and also because, Johnson ('251) teaches forming a wax core having a desired configuration.

In regard to claim 48, JP 61-016817 teaches a two-part compression mold in which the top and bottom molds are brought together to mold said wax core (see Figures) from a preform.

Therefore, it would have been obvious for one of ordinary skill in the art to have used a two-part compression mold for compression molding (plastic deformation) of a wax preform as taught by JP 61-016817 to form the wax core in the process of Johnson ('251) because, JP 61-016817 teaches that compression molding provides for an improved product by avoiding shrinkage and also because, Johnson ('251) teaches forming a wax core having a desired configuration.

14. Claim 49 is rejected under 35 U.S.C. 103(a) as being unpatentable over Johnson (US Patent No. 5,045,251) in view of Vandas (US Patent No. 4,246,884) and in further view of JP 07-314477.

Johnson ('251) in view of Vandas ('884) teaches the basic claimed process as described above.

Regarding claim 49, it is submitted that because Vandas ('884) teaches that all air is removed between wax particles as the molds are brought together (see col. 7, lines 22-30), then the molds include openings in order to remove said air. However, Johnson ('251) in view of Vandas ('884) does not teach a resin trap channel to remove excess resin. However, the use of resin trap channels to remove excess resin in a molding process is well known as evidenced by JP 07-314477 which teaches the use of a resin trap channel (4) connected to a pin hole (3) and to mold cavity (2) (see Figure). Therefore, it would have been obvious for one of ordinary skill in the art to have provided a resin trap channel as taught by JP 07-314477 in the process of Johnson ('251) in view of Vandas ('884) because, JP 07-314477 teaches that a resin trap channel avoids the formation of flash, hence improving product aesthetics.

15. Claim 50 is rejected under 35 U.S.C. 103(a) as being unpatentable over Johnson (US Patent No. 5,045,251) in view of JP 61-016817 and in further view of Holtzberg (US Patent No. 6,344160 B1).

Johnson ('251) in view of JP 61-016817 teaches the basic claimed process as described above.

Regarding claim 50, although Johnson ('251) teaches melting of the wax core, Johnson ('251) in view of JP 61-016817 does not teach reusing the molten wax to make another, new preform core. Holtzberg ('160) teaches a lost wax core process including recycling the molten wax to form new cores (see col. 16, lines 59-61). Therefore, it would have been obvious for one of ordinary skill in the art to have recycled the molten wax as taught by Holtzberg ('160) in the process of Johnson ('251) in view of JP 61-016817 due to a variety of known advantages that recycling provides such as reduced costs, reduced waste, etc.

16. Claim 86 is rejected under 35 U.S.C. 103(a) as being unpatentable over Vandas (US Patent No. 4,246,884) in view of JP 07-314477.

Regarding claim 86, it is submitted that because Vandas ('884) teaches that all air is removed between wax particles as the molds are brought together (see col. 7, lines 22-30), then the molds include openings in order to remove said air. However, Vandas ('884) does not teach a resin trap channel to remove excess resin. However, the use of resin trap channels to remove excess resin in a molding process is well known as evidenced by JP 07-314477 which teaches the use of a resin trap channel (4) connected to a pin hole (3) and to mold cavity (2) (see Figure). Therefore, it would have been obvious for one of ordinary skill in the art to have provided a resin

trap channel as taught by JP 07-314477 in the process of Vandas ('884) because, JP 07-314477 teaches that a resin trap channel avoids the formation of flash, hence improving product aesthetics.

17. Claims 55-62 are rejected under 35 U.S.C. 103(a) as being unpatentable over Johnson (US Patent No. 5,045,251) in view of Vandas (US Patent No. 4,246,884) and in further view of Jones ('116).

Johnson ('251) in view of Vandas ('884) teaches the basic claimed process as described above.

Regarding claim 55, although Johnson ('251) in view of Vandas ('884) teaches heating a wax core, Johnson ('251) in view of Vandas ('884) do not specifically teach that said wax core expands. Jones ('116) teaches a molding process for making a hollow fiber composite structure including, providing a wax core, wrapping said wax core with resin impregnated fiber to form a wrapped assembly, heating said wrapped assembly such that said core expands and applies pressure onto said fiber and melting said core to form said hollow fiber composite structure (see col. 2, lines 55-61 and col. 3, lines 14-39). It is submitted that expansion occurs by more than 0%. Therefore, it would have been obvious for one of ordinary skill in the art to have allowed the wax core to expand as taught by Jones ('116) in the process of Johnson ('251) in view of Vandas ('884) because, Jones ('116) teaches that such expansion provides a pressure onto the fiber layer that removes excess resin, hence providing for an improved molded article.

Further in regard to claim 55 and in regard to claims 56-59, Johnson ('251) teaches melting of the wax material from the resulting fiber reinforced composite (see col. 8, line 15-25).

Further, Jones ('116) teaches heating said wrapped assembly such that said core expands and applies pressure onto said fiber and melting said core to form said hollow fiber composite structure (see col. 2, lines 55-61 and col. 3, lines 14-39). Vandas ('884) teaches that the melting temperature of the wax is in a range of 185-240 °F. Therefore, it is submitted that the heating temperature of the wax core during the resin injection step must within the melting range of the wax core and as such must be within the range of 185-240°F. Further, it is submitted that the actual temperature is a result-effective variable because, if the heating temperature of the wax core during the resin injection step is too high then the wax core will melt prior to curing of the resin and if it's too low then expansion and curing will not occur, hence resulting in a defective product. In re Antonie, 559 F.2d 618, 195 USPQ 6 (CCPA 1977). Therefore, it would have been obvious for one of ordinary skill in the art to have used routine experimentation to determine an optimum heating temperature in the process of Johnson ('251) in view of Vandas ('884) and in further view of Jones ('116) because, Johnson ('251) teaches melting of the wax material from the resulting fiber reinforced composite, hence teaching that if the heating temperature of the wax core during the resin injection step is too high then the wax core will melt prior to curing of the resin and if it's too low then expansion and curing will not occur, and as such teaching that the heating temperature is a result-effective variable.

18. Claims 60-62 are rejected under 35 U.S.C. 103(a) as being unpatentable over Johnson (US Patent No. 5,045,251) in view of Vandas (US Patent No. 4,246,884) and in further view of Jones ('116) and Daskivich (US Patent No. 3,811,903).

Johnson ('251) in view of Vandas ('884) and in further view of Jones ('116) teaches the basic claimed process as described above.

Regarding claims 60-62, although Jones ('116) teaches thermal expansion of a wax core material, Johnson ('251) in view of Vandas ('884) and in further view of Jones ('116) do not teach a specific volumetric expansion. However, it is well known that materials used in a lost core process expand within the range of 1-5% as evidenced by Daskivich ('903) which teaches a specific wax based material used in a lost core molding process having a volumetric expansion of less than 5% when heated from 70-220°F (see col. 3, lines 19-40). Therefore, it would have been obvious for one of ordinary skill in the art to have provided a wax material having a volumetric expansion of less than 5% when heated from 70-220°F as taught by Daskivich ('903) in the process of Johnson ('251) in view of Vandas ('884) and in further view of Jones ('116) because, Daskivich ('903) specifically teaches that wax based material that is used in a lost core molding process has a volumetric expansion of less than 5% when heated from 70-220°F, whereas the process of Johnson ('251) in view of Vandas ('884) and in further view of Jones ('116) requires a wax material that is heated within the range of 185-240°F to function as described and also because of its well known status as evidenced by Daskivich ('903).

Conclusion

19. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

20. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Stefan Staicovici, Ph.D. whose telephone number is (571) 272-1208. The examiner can normally be reached on Monday-Friday 9:30 AM to 6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael P. Colaianni, can be reached on (571) 272-1196. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Stefan Staicovici, PhD

Primary Examiner 3/21/04

AU 1732

March 21, 2004